

1. A method of measuring the volume of a biological cavity having an inner  
2 wall, comprising the steps of:  
moving a multi-axis accelerometer within the cavity such that it interacts with the  
4 inner wall at a plurality of points and outputs an acceleration signal indicative of such  
interactions; and  
6 double integrating the output of the accelerometer to determine the three-  
dimensional volume of the cavity.
2. The method of claim 1, wherein the axes of the accelerometer are  
2 orthogonal to one another.
3. The method of claim 1, wherein the accelerometer is a 3-axis  
2 accelerometer.
4. The method of claim 1, wherein the accelerometer is a micro-electro-  
2 mechanical system (MEMs).
5. The method of claim 1, wherein the accelerometer is supported relative to  
2 the distal tip of a catheter.

6. The method of claim 5, wherein the accelerometer is mounted on a  
2 moveable member facilitating:  
a first position, wherein the member is retracted into the tip for insertion  
4 into the cavity, and  
a second position, wherein the member is extended from the tip for interaction  
6 with the inner wall.

7. The method of claim 5, wherein:  
2 the cavity is a human blood vessel; and  
the accelerometer interacts with the inner wall as the catheter is withdrawn from  
4 the vessel.

8. The method of claim 1, wherein the plurality of points approximates a  
2 helix.

9. A method of measuring the volume of a blood vessel having an inner wall,  
2 comprising the steps of:  
placing a multi-axis accelerometer at the end of a catheter;  
4 inserting the catheter into the blood vessel to be measured;

withdrawing the catheter in such a way that the accelerometer interacts with the  
6 inner wall at multiple points and outputs an acceleration signal indicative of such  
interactions; and

8 double integrating the output of the accelerometer to determine the three-  
dimensional volume of the vessel.

10. The method of claim 9, wherein the axes of the accelerometer are  
2 orthogonal to one another.

11. The method of claim 9, wherein the accelerometer is a 3-axis  
2 accelerometer.

12. The method of claim 9, wherein the accelerometer is a micro-electro-  
2 mechanical system (MEMs).

13. The method of claim 9, wherein the accelerometer is mounted on a  
2 moveable member facilitating:

a first position, wherein the member is retracted into the catheter for  
4 insertion into the cavity, and

a second position, wherein the member is extended from the catheter for  
6 interaction with the vessel wall.

14. The method of claim 9, wherein the plurality of points approximates a  
2 helix.

15. A system for measuring the volume of a biological cavity having an inner  
2 wall, comprising:

a multi-axis accelerometer operative to output a signal indicative of acceleration  
4 as a function of interactions with the inner wall; and

processing circuitry for performing the following functions:

- 6 a) receiving the signal output by the accelerometer, and  
b) double integrating the signal to determine the three-dimensional volume of  
8 the cavity.

16. The system of claim 15, wherein the axes of the accelerometer are  
2 orthogonal to one another.

17. The system of claim 15, wherein the accelerometer is a 3-axis  
2 accelerometer.

18. The system of claim 15 wherein the accelerometer is a micro-electro-  
2 mechanical system (MEMs).

19. The system of claim 15, further including a catheter having a distal tip,  
2 and wherein the accelerometer is supported relative to the distal tip.

20. The system of claim 19, further including a moveable member upon which  
2 the accelerometer is mounted, the moveable member facilitating:

a first position, wherein the member is retracted into the tip for insertion into the  
4 cavity, and

a second position, wherein the member is extended from the tip for interaction  
6 with the inner wall.

21. The system of claim 20, wherein:  
2 the cavity is a human blood vessel; and  
the accelerometer interacts with the inner wall as the catheter is withdrawn from  
4 the vessel.

22. The system of claim 15, wherein the plurality of points approximates a  
2 helix.

23. The system of claim 15, further including apparatus for actively moving  
2 the accelerometer to increase the number of interactions.

24. The system of claim 15, wherein the processing circuitry further includes:

2 a first controller interfaced directly to the accelerometer to perform signal conditioning and direct the accelerometer; and

4 a computer coupled to the first controller to perform the double integrations.

21